

Indiana FIELD OFFICE TECHNICAL GUIDE

Section II Natural Resources Information

Use and Explanation of Cropland Interpretations

Information in this subsection can be used to plan the use and management of soils for crops or pasture. Conservation planners and others using this information can evaluate the effect crop management systems on productivity and on the environment in all or part of the county. This information can be used to maintain or create a land use pattern that is in harmony with the natural soil.

This subsection contains the following:

Soil Erodibility (K) Factor	Soil-Loss Tolerance (T) Value
Hydrologic Soil Groups	Prime Farmland List
Land Capability Classification	Productivity Estimates

Cropland Interpretations

General

Soil erodibility factors (K) and soil-loss tolerances (T) are used in an equation that predicts the amount of soil loss resulting from rainfall erosion of cropland. The soil-loss prediction procedure is useful to guide the selection of practices for soil and water conservation. The procedure is outlined and illustrated in Agricultural Handbook No. 537.

Soil Erodibility (K) Factor

The soil erodibility factor "K" indicates the susceptibility of a soil to sheet and rill erosion by water. Soil properties that influence erodibility by water are: (1) Those that affect infiltration rate, movement of water through the soil, and water storage capacity; and (2) those that resist dispersion, splashing, abrasion, and transporting forces from

rainfall and runoff. Soil properties that are most important are percent silt plus very fine sand, percent organic matter, percent sand coarser than very fine sand, structure, and permeability.

Soil-loss Tolerance (T) Factor

The soil-loss tolerance factor "T" is an estimate of the maximum annual rate of soil erosion that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons of soil loss per acre per year. Rates of 1 through 5 are used, depending upon soil properties and prior erosion.

Soil-loss tolerances were subjectively evaluated, based on the following general guides:

1. maintenance of an adequate rooting depth for crop production
2. potential crop yield reduction
3. maintenance of water control structures affected by sedimentation
4. prevention of gullies
5. value of nutrients lost

Hydrologic Soil Groups

General

The Hydrologic Soil Group, designated A, B, C or D, is a group of soils that, when saturated, have the same runoff potential under similar storm and cover conditions. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to seasonally high water table, intake rate, permeability after prolonged wetting, and depth to very slowly permeable layer. The influences of ground cover and slope are treated independently --- not in hydrologic soil groups.

In the definitions of the classes, infiltration rate is the rate at which water enters the soil at the surface and is controlled by surface conditions.

Transmission rate is the rate at which water moves in the soil and is controlled by properties of the soil layers.

Hydrologic Soil Group A

Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well-drained to excessively drained sands or gravels. These soils have a high rate of water transmission. (Low runoff potential)

Hydrologic Soil Group B

Soils having moderate infiltration rates when thoroughly wetted, consisting chiefly of moderately deep or deep, moderately well or well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

Hydrologic Soil Group C

Soils having slow infiltration rates when thoroughly wetted, consisting chiefly of (1) soils with a layer that impedes the downward movement of water, or (2) soils with moderately fine or fine textures and slow infiltration rate. These soils have a slow rate of water transmission.

Hydrologic Soil Group D

Soils having very slow infiltration rates when thoroughly wetted, consisting chiefly of (1) clayey soils with high swelling capacity or potential, (2) soils with a high permanent water table, (3) soils with a claypan or clay layer at or near the surface, and (4) shallow soils over nearly impervious materials. These soils have a very slow rate of water transmission. (High runoff potential)

Dual Hydrologic Groups

Dual hydrologic groups, A/D, B/D and C/D, are given for criteria with soils that can be adequately drained. The first letter applies to the drained condition and the second to the undrained condition. Only soils that are rated D in their natural condition are assigned to dual groups.

The hydrologic soil groups are listed in the table "Water Features" in *Section II-(iii)-J*, Engineering Interpretations.

Prime and Important Farmland

Definition

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also

available for these uses (the land could be cropland, pastureland, forest land, or other land, but not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods.

In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding.

Soils that have limitations, such as a high water table or flooding, may qualify as prime farmland if these limitations are overcome by such measures as drainage or flood control. State important soils are also noted.

Land Capability Classification

The land capability classification system is used to show, in a general way, the suitability of soils for cropland. It is a three-category interpretative system. The two highest categories, class and subclass, give broad perspective of the suitability of map units for certain crops or pasture. These categories indicate the degree and kinds of limitations for these uses. The system evaluates soils for mechanized farming systems that produce the more common cultivated field crops, such as corn, small grains, soybeans, and hay.

Capability Class

The highest category of the system is the capability class. The capability classes are groups of soils that have the same general suitability for the broad kinds of use common on farms and ranches. There are eight classes designated by Roman numerals I through VIII.

Classes I, II, III, and IV are suitable for mechanized production of common field crops if properly managed, and for production of pasture and woodland. The degree of limitation for production of cultivated crops increases progressively for class I to class IV. Limitations may affect production as well as the risk of permanent soil deterioration, as by erosion.

Classes V, VI, and VII are generally not suited to mechanized production of common field crops without special management, but are suitable for permanent cover such as grasses and trees. The severity of the soil limitations for crops increases from class V to

class VII. Areas in class VIII are generally not suitable for crops, pasture, or wood products without management that is impractical. Class VIII areas may have potential for other uses, such as recreation or wildlife habitat.

Capability Subclass

The subclass identifies the dominant kind of limitation in the class. They are designated by adding a small letter, e, w, s, or c, to the class numeral, for example, IIe. The letter e shows that the main limitation is risk of erosion unless a close-growing plant cover is maintained; w shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty, or stony; and c, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

There are no subclasses in class I because the soils of this class have few limitations. The soils in class V are subject to little or no erosion, but they have other limitations that restrict their use mainly to pasture, woodland, wildlife habitat, or recreation. Class V contains only the subclasses indicated by w, s, or c.

Productivity Estimates

Crop Yield

The average yields per acre of principal crops under a high level of management are presented in published soil surveys and soil interpretation records. In any given year, yields may be higher or lower than those indicated in these tables because of variations in rainfall and other climatic factors. The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, or green manure crops; and harvesting that insures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. Absence of a yield indicates that the soil is not suited to the crop or the crop is generally not grown on the soil.

Productivity Index

The productivity index rating system provides an index for ranking all the soil mapping units in Indiana based upon their suitability to produce crops. An individual productivity index rating for a soil mapping unit reflects the integrated effects of numerous factors that influence the yield potential.

Many users consider the comparative yields between soils to be of more value than the actual yields because the index relationships are likely to remain constant over a period of years.
